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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/066,591

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Misuk Yamazaki

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09/22/2004

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EXAMINER

LEE, EUGENE

ART UNIT

PAPER NUMBER

2815

DATE MAILED: 09/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

22

Office Action Summary	Application No. 10/066,591	Applicant(s) YAMAZAKI ET AL.	
	Examiner Eugene Lee	Art Unit 2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5 and 9-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5 and 9-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/8/04 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1 thru 3, and 9 thru 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Narita et al. 4,305,088 in view of Theroux 4,349,831. Narita discloses (see, for example, FIG. 3) a semiconductor rectifier (semiconductor device) comprising a header lead (lead electrode) 2, electrode plate (case electrode) 1, silicon chip 7, solder (soldering connection members) 8, and header section (electrically conductive plate) 2a. In column 5, lines 22-23, Narita discloses the header section comprising iron which has a coefficient of linear expansion around 12 ppm/degree Celsius. In column 3, line 35, Narita discloses the electrode plate may be made of copper which has a coefficient of linear expansion around 17 ppm/degree Celsius. Therefore, the header section (electrically conductive plate) has a coefficient of linear expansion

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smaller than that of the electrode plate (case electrode). The header section has a maximum width smaller than a maximum width of said silicon chip. Narita does not disclose said lead electrode having a first portion and a second portion, said first portion being formed between said second portion and the electrically conductive plate, wherein said first portion is wider than said second portion, and wherein said first portion is joined to said electrically conductive plate through one of said soldering connection members. However, Theroux discloses (see, for example, figure) a semiconductor device comprising an electrically conductive electrode (lead electrode) 28 having an enlarged end portion (first portion) 30 and an upstanding portion (second portion) 32, and wherein said enlarged end portion is joined to a metal stress relief layer 26 thorough a solder layer (one of said soldering connection members) 29. The enlarged end portion stabilizes the upstanding portion to the semiconductor device. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have said lead electrode having a first portion and a second portion, said first portion being formed between said second portion and the electrically conductive plate, wherein said first portion is wider than said second portion, and wherein said first portion is joined to said electrically conductive plate through one of said soldering connection members in order to stabilize a header lead (lead electrode) in a semiconductor device.

Regarding claim 2, the coefficient of linear expansion of the silicon chip is approximately 3 ppm/degree Celsius (for silicon), therefore, the coefficient of linear expansion of said electrically conductive plate (12 ppm/degree Celsius) is equal to or larger than 50 % of that of said semiconductor chip (3 ppm/degree Celsius).

Regarding claim 3, iron is inherently known to be stronger than copper.

Regarding claims 12, 15, 18, and 21, see figure wherein Theroux discloses the solder layer (one of said soldering connection members) 29.

Regarding claims 13, 14, 16, 17, 19, 20, 22, and 23, see figure wherein Theroux discloses an enlarged end portion (first portion) 30, and upstanding portion (second portion) 32 which form a T configuration with the enlarged end portion being substantially parallel to the stress relief layer 26 and the upstanding portion being substantially perpendicular to the stress relief layer.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Narita et al. '088 in view of Theroux '831 as applied to claims 1-3, and 9-23 above, and further in view of Yokoyama 07-221235 JPO. Narita in view of Theroux does not disclose said electrically conductive plate having a layer structure of copper-iron alloy-copper, and the iron alloy containing a 30% to 50% with Ni remainder Fe or a 20 % to 40 % Ni - 50% to 60% with Fe remainder Co. However, Yokoyama discloses (see abstract) a metal lamination member comprising two copper layers and a 54% Fe and residual Co. The metal lamination member prevents deterioration of electrical characteristics for a long term. Therefore it would have been

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obvious to one of ordinary skill in the art at the time of invention to use the metal lamination member in order to prevent deterioration of electrical characteristics for a long term.

Response to Arguments

6. Applicant's arguments with respect to claims 1-3, 5, and 9-23 have been considered but are moot in view of the new ground(s) of rejection.

INFORMATION ON HOW TO CONTACT THE USPTO

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eugene Lee whose telephone number is 571-272-1733. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 571-272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Eugene Lee
September 18, 2004

A handwritten signature in black ink, appearing to read 'Eugene Lee', with a stylized, cursive script.